

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Currently Amended) A multi-level (hierarchical) process monitoring system comprising a process monitoring unit, at a higher level of the system, and a plurality of sensors at a lower level of the system, at least one of the sensors having SEVA capability (self-validating capability), the sensors being adapted to provide respective measurement values of respective process variables to said monitoring unit, said monitoring unit being so arranged as to monitor the outputs of the sensors and to identify any significant apparent change in the process conditions ~~as detected from~~ based on a comparison of an overview of said sensor outputs with reference information, and on detection of an apparent significant change, to request additional status information from at least one of the SEVA sensor/s to determine whether the apparent change is in reality due to a change in the characteristics of a particular SEVA sensor rather than an actual significant change in the process conditions.

2. (Original) A process monitoring system as claimed in claim 1 comprising one or more actuators to effect process changes, the actuators being arranged to provide the monitoring unit with actuator position signals.

3. (Previously Presented) A process monitoring system as claimed in claim 1 in which most of the sensors are SEVA sensors.

4. (Currently Amended) A process monitoring system as claimed in claim 1 in which the monitoring unit ~~implements~~ obtains the overview using a multivariate statistical analysis of the measurement values of the sensors, and compares the results of that analysis with the reference information to identify any significant apparent change in process conditions, to determine ~~whether or not~~ to initiate interrogation of the SEVA sensor/s.

5. (Currently Amended) A process monitoring system as claimed in claim [[1]] 4 in which the reference information is comprised of predictions of a model and historical data of stored statistical analyses.

6. (Currently Amended) A process monitoring system as claimed in claim [[1]] 5 in which the model utilizes actuator position information.

7. (Currently Amended) A process monitoring system as claimed in claim 1 in which the request for additional status information initiates [[the]] an application of a non-routine test in or to at least one of the SEVA sensors.

8. (Previously Presented) A process monitoring system as claimed in claim 1 in which at least some SEVA sensors measure the same variable, and the SEVA measurements (VMV, VU and MV status) of the same variable are combined to generate a best estimate.

9. (Cancelled)

10. (New) A method comprising:
receiving a first sensor signal from a first sensor monitoring a process, the first sensor being a self-validating (SEVA) sensor;
receiving a second sensor signal from a second signal monitoring the process;
analyzing the first sensor signal and the second sensor signal at a control unit to determine apparent status information related to the process;
comparing the apparent status information with reference data to obtain comparison information; and
obtaining sensor status information related to the first sensor, in response to the comparison information.

11. (New) The method of claim 10 further comprising distinguishing between a change in a condition of the process and a malfunction of the first sensor, based on the sensor status information.

12. (New) The method of claim 10 wherein analyzing the first sensor signal and the second sensor signal comprises implementing a multivariate statistical analysis of the first sensor signal and the second sensor signal.

13. (New) The method of claim 10 wherein the reference data includes a pre-determined model of behavior of the first sensor and the second sensor with respect to the process.

14. (New) The method of claim 13 wherein the model is based on actuator position signals obtained from actuators involved in the process.

15. (New) The method of claim 10 wherein the reference data includes historical data describing past behavior of the first sensor and the second sensor with respect to the process.

16. (New) A system comprising:
a first sensor operable to output a first measurement of a first variable related to a process;
a second sensor operable to output a second measurement of a second variable related to the process;
a process monitor having access to sensor reference information and operable to analyze the first measurement and second measurement to obtain an apparent process status, and further operable to compare the apparent process status with the sensor reference information so as to distinguish between a sensor malfunction and an actual process status.

17. (New) The system of claim 16 wherein the process monitor is operable to analyze the first measurement and the second measurement using a multivariate statistical analysis.

18. (New) The system of claim 16 wherein the reference information includes a theoretical model of behavior of the process.

19. (New) The system of claim 18 wherein the theoretical model includes position signals obtained from actuators involved in implementing the process.

20. (New) The system of claim 16 wherein the reference information includes historical data describing the process.
